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Machine Translation Shortcomings and Teaching Translation

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Abstract: *Nowadays, machine translation is considered to be a frequently used tool to render various types of texts related to such different spheres as science, film industry, etc. Statement of the problem: currently, as the higher school system in Kazakhstan starts its' integration process into world education (Kolomejceva & Makeeva, 2004), together with the re-structuring of the system itself it is a priority to translate course books and manuals from English into Kazakh and Russian and to adapt them for Kazakhstani students. A significant amount of information to be translated and the need to do it at the short notice might cause the use of machine translation tools to speed the translation process up. To clarify advantages and disadvantages of machine translation (especially for manuals and course books), the author applied such methodology as comparative analysis of the source text and its' translated version. As a result, it is possible to state that machine translation tools are not able to replace the human translation of such complicated texts; moreover, the need of meticulous proofreading of target text is obvious as well as the urgent necessity of translation quality improvement. On the other hand, all the errors which have been observed in the target text, should be specified, categorized, and used in teaching scientific text translation to make it better. The exercises based on comparative analysis and target text proofreading can be considered as an effective tool for translators' skills development. The author had chosen the course book Natural Gas Processing from Midstream to Downstream by Elbashir et al. (2019) and its Russian version as a research material for pre-translation and comparative analysis and then for the target text proofreading. So the main goals of the given research consisted in (1) finding out the inappropriate cases of translation; (2) explaining the type of error and (3) preparing the exercises to prevent making such mistakes by our students in Translation Studies and, generally, to improve pre-service translators' competencies.*

Keywords: *Translation errors; machine translation;comparative analysis; incorrect equivalence; lack of semantic correspondence;teaching translation.*

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Introduction

The beginning of the XXI century was marked by the incredible growth of machine translation application; nowadays, machine translation programs are frequently used in different fields to render a variety of texts. Otherwise, it should be taken into account that machine translation is not perfect yet; moreover, a professional translator should use all his skills to adapt the text he got as a result of translation program application. Under Kazakhstani conditions, the problem seems to be really topical, and it should be studied in two different ways. Firstly, as a problem of translation quality, because currently, as the higher school system in Kazakhstan starts its' integration process into world education, together with the re-structuring of the system itself it is a priority to translate course books and manuals from English into Kazakh and Russian and to adapt them for Kazakhstani students. A significant amount of information to be translated and the need to do it at the short notice might cause the use of machine translation tools to speed the translation process up. To clarify advantages and disadvantages of machine translation (especially for manuals and course books), the author applied such methodology as comparative analysis of the source text and its' translated version. As a result, it is possible to state that machine translation tools are not able to replace the human translation of such complicated texts; moreover, the need of meticulous proofreading of target text is obvious as well as the urgent necessity of translation quality improvement. On the other hand, all the errors which have been observed in the target text, should be specified, categorized, and used in teaching scientific text translation to make it better. The exercises based on comparative analysis and target text proofreading can be considered as an effective tool for translators' skills development. The author had chosen the course book *Natural Gas Processing from Midstream to Downstream* by Elbashir et al. (2019) and its Russian version as a research material for pre-translation and comparative analysis and then for the target text proofreading.So our main goals consist in (1) finding out the inappropriate cases of translation; (2) explaining the type of error and (3) preparing the exercises to prevent making such mistakes by our students in Translation Studies and, generally, to improve pre-service translators' competencies.

Then, the hypothesis of our research paper looks as follows: if the exercises containing the cases of typical errors in translation should be used in the process of translators' training then it will help to prevent pre-service translators from making such mistakes in their translation practice because they will be able to notice the inappropriate character of those variants of rendering the text.

Literature Review

When translating, you must follow a simple rule — "in order to translate, you need to know two languages and the subject of speech. It is vital to remember that competent scientific translation involves the use of theoretical knowledge about the basics of translation, as well as methods and techniques for decoding the original text in order to obtain an adequate translation into Russian. The resulting translation text, after proofreading, checking, and editing, must meet the basic requirements for scientific and technical translation: it must be accurate, concise, clear, logical, and literary" (Ordyan, 2018).

In contemporary translation studies, classification of translation errors is represented in a variety of scientific papers, i.e. in research works by Garbovskiy (2007),

Kunilovskaya (2008), Sdobnikov (2007a, 2007b) and other scholars. Thus, Petri (2019) gives a definition of a translation error as "an error refers to the production of incorrect forms in speech and writing by a non-native speaker of the target language, due to the incomplete knowledge of the rules of that target language". On the other hand, Mossop (2014) focuses on such parameters of translation work and editing which allow the translators to avoid making mistakes, as mechanics, accuracy, sublanguage, smoothness, layout, idioms rendering, completeness, and logic. Moreover, they also experience some difficulties while choosing the appropriate terminology and writing style. Also, Popescu (2013) who used a corpus-based approach to study the errors in translation, considered the lack of linguistic knowledge as a factor caused translation errors among translators. Basil (2013) also highlighted the necessity of translation errors analysis in translation didactics.

According to Garbovskiy (2007), typology of translation errors in decoding system of meanings represented in the source text can be presented as follows:

- Lack of proficiency in source and target languages.
- Insufficient cognitive experience.
- Lack of knowledge about realia described in the original text.
- Inappropriate understanding of system of meanings represented in the source text.
- Misunderstanding of what the author says about the subject.
- Inability to distinguish features of individual style of the author of original work"(Garbovskiy, 2007).

For instance, errors caused by misunderstanding of meanings of the source texts include incorrect interpretation of the pragmatic aspect of the original statement.

In short, Garbovskiy divides logical and semantic errors into levels as: (1) errors at the level of concept, (2) errors at the level of complex concept, (3) errors at the level of statement/utterance, (4) errors of the subject situation.

The second type in this classification includes errors of understanding at the level of "sign–concept".They also can be determined as semantic errors, because translators not being able to identify the sign and find the appropriate correspondance, confus

The next type is errors of understanding at the level of "sign – complex concept". This type is characterized by errors in rendering collocations and idioms.

Furthermore, translation errors can be described not only with the misconception or confusion meanings of words and phrases. Also, they can affect the meanings of whole sentences and more complex logical constructions. ***Errors of understanding at the level of "sign – utterance"*** are characterized by Garbovskiy (2007) as errors in decoding the meaning of logical statements in the source text. Those errors often come from a lack of attention to both semantics and syntactic structure of the statement.

In our opinion, one of the typical mistakes are the ***errors of situation understanding***, which take place at a greater level than one statement, because they are related to the incorrect representation of the situations described in the source text. The reference situations described in the text represent a system of actors interacting in certain conditions, which the translator should follow to decipher. In this hermeneutic operation, the dictionary does not always help as it provides a list of words meanings. On the contrary, text contains a system of meanings involved in all interrelated units of the language. Dictionary meanings and text meanings of words can quite often be matched, but not always. Moreover, the vocabulary equivalent in the target language turns out to be endowed with certain meaning for the translator only when the translator has sufficient knowledge of the subject matter described in the original text.

Thus, the correct and complete decoding of the referential situation described in the original text assumes that the translator has necessary cognitive experience in the exact area of life that the author of the original offers in the description. Modern translation theory, based on the data of cognitive linguistics, widely uses the concept of a frame as one of the ways to present a stereotypical situation. A frame should be understood as a two-sided cognitive essence: on the one hand, it is a certain system of knowledge about this or that precedent or even typical, i.e. regularly repeating, situation of real reality formed in the consciousness of an individual based on previous cognitive experience. On the other hand, a frame represents a dynamic cognitive category. It arises in the consciousness of the individual who perceives the reality under the influence of certain conditions that activate his or her knowledge system.

According to Komissarov (2001), scientific text is formal and structured logically, so the use of "neutral style" presupposes the absence of imagery and expression of emotions as a negative stylistic feature. As all our examples are excerpted from scientific texts, those peculiar features should be taken into account as well.

On the other hand, Borishanskaya & Kurbakova (2018) focused on such requirements for scientific and technical texts translation as equivalence, adequacy, information content, logic and clarity of presentation. To translate scientific and technical texts accurately, a translator needs the following skills and knowledge: theoretical competences in phonetic, lexical and grammatical systems of foreign language (lexical items, grammar rules, word formation); peculiarities of scientific and technical texts translation (types of transformations and equivalents); practical skills (use of translation methods: transliteration, calculus, substitutions, permutations, additions, omissions, methods of descriptive and antonymic translation); extra-linguistic knowledge (use of sufficient information to translate a specialized text) are necessary in the process of translating the text and building meaningful and adequate sentences in the language of translation.

While analyzing scientific texts peculiarities, it should be noted, first of all, that such texts require a clear logic of presentation in translated version. Scientific style sentences are monotonous in their purpose, and they are almost always narrative. Interrogative sentences are rare and are used to draw the reader's attention to a question. Emotional expressiveness is almost completely absent (Khomenko, 2013).

Methodology of the text analysis

To conduct comparative analysis of source and target text and to prepare the exercises for translators' skills development the author focused on such methodological principles as:

(a) the correspondence between the content of source and target texts;

(b) stylistic similarity between the source and target texts;

(c) terminological similarity of the source and target texts.

Our findings demonstrate that the most typical errors in our material were related to (a) inappropriate equivalents and (b) lack of semantic and/or terminological similarity between source and target texts.

As it is stated above, the course book "Natural Gas Processing from Midstream to Downstream" by Elbashir et al. (2019) and its' Russian version is considered to be a source of translation errors for professional training; the need for careful editorial work becomes obvious when comparing the source text and its' translated version. This is also evidenced by the results of linguistic examinations conducted with the aim of correcting and

improving the quality of translation, which can be used in the process of teaching written translation in order to develop editing skills and prevent inaccuracies.

While finding out the errors, the following criteria of linguistic analysis and examination of the target text were applied:

- Compliance with the content similarity of the source text and its' translated version (omission of any fragments of the source text, as well as distortion of their meaning and style);
- Matching the style of the source text;
- Correspondence between source and target texts concerning all graphic images (including inscriptions to drawings, diagrams, graphs and formulas)
- The correspondence of the translated terms to the original text, their correctness and unambiguity
- Correspondence of lexical composition and syntactic organization of the source and target texts
- Compliance of brand names, program codes, references in the original language
- Compliance with the spelling of the target language, absence of errors, inaccuracies and typos in the translation

According to the errors classification provided by Garbovsky (2007), the prevailing type of errors represented in our text, and, correspondingly, in the exercises, is related to the rendering of a meaning, even in case of using terms.

The example sentences containing typical mistakes in translation which were excerpted from the Russian version of the book Natural Gas Processing from Midstream to Downstream by Elbashir et al. (2019) are represented below:

Table 1. Samples of typical mistakes used for translators training.

p. 7.Going Further	has been translated into Russian as *Dal'neishiye shagi;* otherwise, it should be detalized (Which field has been mentioned? Is it a research? etc)
P. 12 8.3 Natural Gas Supply Chains	***Cepi postavok prirodnogo gaza*** / the commonly used Russian equivalent is «sistema, cepochka postavok»
Table 9.4.1 (captions) «Feedstock»	*cyr'evye materialy* should be replaced by «ishodnoe syr'e/zapas syroj nefti».
P. 31 Table 3. «Creates economies of scale»	*Sozdaet jekonomiju masshtaba - jekonomija* should be replaced by *effekt masshtaba*;
Table 1.2 «value»	Has been translated as «cennost', poleznost'»; to render the meaning represented in the source text, it should be translated into Russian as *bolee nizkaja stoimost' v konkurencii s uglem, mazutom, gidrojenergetikoj i t. d.*
P. 32 Table 1.6 Net-backs diminish with reducing volume and/or increasing distances	Should be translated as *vychitanie tamozhennoj poshliny iz jeksportnoj ceny pri snizhenii ob#emov (postavok) i/ili uvelichenii rasstojanija* instead of *snizhenie poshliny pri uvelichenii rasstojanija*
P. 56 In the case of LPG fracturing, two flaring options will be considered, flaring 100% of the flowback gas for the government allowed 10 day maximum	*«V sluchae razryva SPG budut rassmotreny dva varianta szhiganija, szhiganie 100% protivotoka gaza dlja pravitel'stva dopuskaetsja maksimum 10 dnej»* - instead of ***pravitel'stvo,*** such equivalent as *upravlenie* should be used
"Heavy" oils, such as those from tar sands, can have a large fraction of components heavier than those in diesel fuel»	*«Tjazhelye» vidy nefti, takie kak neftenosnye peski, mogut imet' bol'shuju dolju komponentov, bolee tjazhelyh, chem takovye v dizel'nom toplive* – Tar sands should not be considered as a type of oil; therefore, it should be translated as *poluchennye iz neftenosnyh peskov (smth taken from the tar sands)*

Source: Author's own conception

Case study methodology and results

To find out whether it is effective for pre-service translators to analyse short texts/sentences containing mistakes, the following Research Questions have been stated:

1) What are the strong points of using those materials as a tool of translators' skills development?

2) What are the main problems of using those materials as a tool of translators' skills development?

Firstly, those research questions allow us to summarize various opinions represented in research works dedicated to translators' training and translation errors; secondly, they presuppose the study of students' results to find out strong points of using texts with translation errors in the process of teaching translation and specific translators' skills improvement, and to identify the main problems of those materials application.

RESEARCH POPULATION

As it has been stated before, 47 2nd year students in total were involved in our research process; during the experiment, students of two groups were involved, Control group with 23 students and Experimental group including 24 students. The level of English in both groups was quite similar as it was shown at the Pre-test stage.

Research process

The case study research was conducted in the Fall semester of 2022-2023 academic year. During the research process, students from one group (Experimental) tried 10 exercises based on translation errors (see above) for the last 5 weeks whereas students from the Control group did not do those exercises. During the 3rd week of the research and at the end of the term, students were asked to translate the technical texts similar to the aforementioned one.

Limitations

While conducting our research, we have faced to several types of limitations such as:

- "Field of science" limitations (all the exercises were based on the same technical text);
- Age and professional experience of our students (2nd year students only were involved in our case study);
- Short period of time (5 weeks for the research process);
- Specific Kazakhstani context which can differ from the world-scale one (thus, the error types can vary as the structure and semantics of other language pairs can be absolutely different from English/Kazakh/Russian).

Results

The results of both Control and Experimental groups were measured by means of the T-test which are shown below in Tables 2,3, and 4.

For the Pre-experimental results, P value and statistical significance looked as follows: the two-tailed P value equals 0.6021. By conventional criteria, this difference was considered to be not statistically significant. Confidence interval: the mean of Group One minus Group Two equals 1.70; and 95% confidence interval of this difference: From -4.95 to 8.34 Intermediate values used in calculations: t = 0.5290; df = 22; the standard error of difference was equal to 3.205

Table 2. Pre-experimental test results

	Group One (Experimental)	Group Two (Control)
Mean	80.70	79.00
SD	9.91	10.37
SEM	2.07	2.16
N	24	23

Source: Author's own conception

For While-experimental results (conducted in two weeks after the research work had been started, on the third week of the research process), P value and statistical significance were also the two-tailed P value, but it equals 0.5680. By conventional criteria, this difference also was not statistically significant. Confidence interval: the mean of Group One minus Group Two equals 1.91; 95% confidence interval of this difference: From -4.93 to 8.76. Intermediate values used in calculations were considered as t = 0.5797; df = 22; standard error of difference was equal to 3.300.

So as it was shown in the following Table, the results of Experimental group are better than it was demonstrated by the Control group; but it is not a considerable difference:

Table 3. While-experimental test results

	Group One (Experimental)	Group Two (Control)
Mean	82.43	80.52
SD	9.91	9.43
SEM	2.17	1.97
N	24	23

Source: Author's own conception

While analyzing the Post-experimental results the following data were given by t-test: P value and statistical significance presupposed the two-tailed P value as well but it was equal to 0.1353, which was considered to be not statistically significant. The Confidence interval was equal to 3.83; and 95% confidence interval of this difference: was from -1.29 to 8.94. Intermediate values used in calculations were: t = 1.5505, df = 22; standard error of difference = 2.468

Table 4. Post-experimental test results

	Group One (Experimental)	Group Two (Control)
Mean	84.83	81.00
SD	8.18	8.26
SEM	1.71	1.72
N	24	23

Source: Author's own conception

Summarizing all mentioned above it is possible to come to the conclusion that both groups showed the progress; otherwise the upward trend in the Experimental group seemed to be more visible than it took place in the Control group. As it was shown by out data, the gap between those two group was increasing step by step. In our opinion, it shows the effectiveness of translation error analysis for pre-service translators training. On the other hand, the main problems of such material use consist in (1) various errors which can be hardly classified and standardized (sometimes there are ambiguous examples corresponding to 2 types of errors at the same time); (2) lack of time for the analytical work, because students from the Experimental group should do this exercises as additional tasks. Otherwise, in our opinion, such work should be integrated into Translation Studies curriculum.

Conclusion

One of the factors that lead to improvement of the quality of translation is the identification of the mistakes that are usually made in the process of translation, discovery of their emergence and causes, and prevention of them. The errors discussed above show that those common mistakes happened because of a lack of understanding. We would like to re-emphasize that the most errors in the translation of scientific text are made by online translation programs.

There were many steps of the error analysis. First step is distinguishing the types of errors classified by Garbovskiy (2007). Without being able to differentiate them all, translating ability would not be sufficient.

The next step is about detecting any errors in the sample and identifying its type. It would happen only when reading both the source and target texts and doing the comparative analysis.

The third step consists in finding semantically right equivalent as getting a semantically close equivalent is the most critical part of the whole process.

The findings based on the analysis have already proved that the translation made by a computer program, is not able to replace the human translation. From this point of view, we want to draw a conclusion as follows:

First, the classification of Garbovskiy (2007), that we have chosen, is systematic; moreover, it represents various types of mistakes so, it is possible to differentiate the most significant translation errors. At the same time, various types of errors identified by Kunilovskaya (2008) should be mentioned and then included into the exercises to improve pre-service translators' skills. Second, we have discussed the types of translation errors that could happen and as an example, examined various mistakes in the Russian version of scientific text. What we conclude from that there is no currently substitute for a human

translator as it has been shown by the mistakes made in scientific text translation with the application of computer program.

Third, our case study shows that those mistakes can be used in the process of pre-service translators training, as it has been demonstrated by the comparison of Pre-experimental, While-experimental and Post-experimental text results. Thus, the results and quality of scientific text translation in the Experimental group (whose students did the exercises based on the real errors in translation excerpted from the above mentioned source) were better than ones demonstrated by the Control group where we did not use such kind of exercises. In our opinion, the progress of our students show the long-term benefits of such system of exercises in pre-service translators training. Also, despite the problems of the integrating those materials into the teaching process, we suggest to use them for pre-service translators training because of their effectiveness shown in our case study.

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